

APPLICATION FOR THE STABILISATION OF THE NAME
FOR THE GENUS OF THE CLASS ROTIFERA FORMERLY
KNOWN AS "PEDALION" HUDSON, 1871, OR "PEDALIA"
BARROIS, 1878, INCLUDING A REQUEST FOR THE USE OF
THE PLENARY POWERS TO VARY THE TYPE SPECIES
OF THE GENUS "HEXARTHRA" SCHMARDA, 1854, AND
TO SUPPRESS THE TRIVIAL NAME "POLYPTERA"
SCHMARDA, 1854, PUBLISHED IN COMBINATION WITH
THAT GENERIC NAME, AND MATTERS INCIDENTAL
THERE TO

By G. M. NEAL

(Department of Zoology, University of Toronto, Canada)

(Commission's reference Z.N.(S.)340)

1. The object of the present application is to invite the International Commission on Zoological Nomenclature to use its plenary powers to stabilise the name for the genus of the Class Rotifera formerly known as *Pedalion* Hudson, 1871, or as *Pedalia* Barrois, 1878, by designating a recognisable species to be the type species of the genus *Hexarthra* Schmarda, 1854. The facts of this rather complicated case are set out in the following paragraphs.

2. The generic name *Pedalion* Hudson, 1871 (*Mon. microscop. J.* 6: 121, pl. 94) was established for a monotypical genus for a new species then named *Pedalion mira*. The name *Pedalion* Hudson, 1871, is invalid, because it is a junior homonym both of *Pedalion* Dillwyn, 1817 (*Descr. Cat. Shells*: 282) and of *Pedalion* Swainson, 1838 (*Nat. Hist. Fishes* 1: 199). It will be convenient if, before considering whether there is any subjectively identical nominal genus, the name of which should replace the invalid name *Pedalion* Hudson, 1871, we examine briefly the subsequent history of Hudson's name *Pedalion*.

3. In 1877 Barrois gave a paper at the Sixth Session of the "Association française pour l'Avancement des Sciences" held at Le Havre, entitled: "Sur l'anatomie et le développement du *Pedalia mira*". This paper was published in 1878. Although, as noted above, the generic name was written in the form *Pedalia* in the title of Barrois' paper, that name appeared in the form *Pedalion* at every point at which it appeared in the body of that paper. Rousselet in 1914 (*Association française pour l'Avancement des Sciences*, 43e Session, Le Havre, C. R. : 535-536) drew attention to this inconsistency and raised the question whether it was due to an editorial error or whether it should be explained on the ground that Barrois was aware of the fact that the name *Pedalion* Hudson, 1871, was invalid and tried to get over this difficulty by substituting the variant form *Pedalia* in the title of his paper. It must be noted however that an abstract of this paper of Barrois' was published in the issue of the *Revue scientifique* of 29th September 1877, and that in this paper

only the spelling *Pedalion* occurs. In this abstract no title was given for this paper and it is possible that it is for this reason that the spelling *Pedalia* did not appear on this occasion, for (as noted above) it was only in the title of Barrois' paper that the spelling *Pedalia* was used. It may be noted incidentally at this point that the species dealt with by Barrois in the foregoing paper is not only not (as he supposed) the species which in 1871 Hudson had named *Pedalion mira*; it is not even referable to the same genus; it is actually a marine species of the genus *Synchaeta* Ehrenberg, [1832] (*Abh. preuss. Akad. Wiss.* 1831 : 135).

4. Since 1913 the genus named *Pedalion* by Hudson has been called both by that name and by the reputed name *Pedalia* Barrois, 1878, the latter having even made its way into Neave's *Nomenclator zoologicus* (3 : 632), where it is quoted as a substitute name for *Pedalion* Hudson, 1871, the reference being given as "*Pedalia* Barrois, 1878, *C. R. Ass. Franc.* 6(1877 Le Havre), 661".

5. I am bound to say that, in my view, it is impossible to accept, as a valid substitute name, a name (such as *Pedalia*) which appears only in the title of a paper, the correct spelling (in this case, *Pedalion*) occurring at every point in the body of the paper itself, where, if Barrois had intended to emend Hudson's name *Pedalion* in this way, he would certainly have used the spelling "*Pedalia*". It is clear, however, that no progress can be made in the stabilisation of the name of this important genus until this preliminary question has been disposed of. I accordingly ask the International Commission on Zoological Nomenclature to give a ruling that the use of the word *Pedalia* in the title (but not in the text) of Barrois' paper does not constitute the publication of a generic name consisting of this word, the spelling "*Pedalia*" being due, it must be concluded, to some inadvertence on the part of the editor of Barrois' paper or on that of the printer.

6. It is necessary now to consider whether there is any nominal genus possessing a valid name, the type species of which can be regarded as belonging to the genus *Pedalion* (or *Pedalia*) as hitherto understood. An examination of the literature shows that there is such a nominal genus, which does, or may, satisfy this condition. This is the genus *Hexarthra* Schmarda, 1854 (*Denskr. Acad. Wiss. Wien* (Math.—natur. Kl.) 7 (No. 2) : 15). This genus in monotypic, its sole species being *Hexarthra polyptera* Schmarda, 1854, a then newly described (: 15) nominal species. This species is therefore the type species of the genus *Hexarthra* Schmarda by monotypy.

7. Our next step must be to consider the claims of the nominal species *Hexarthra polyptera* Schmarda to be regarded as representing a species of *Pedalion* (or *Pedalia*). The specimen upon which Schmarda based his description and figures of this nominal species, which was hardly visible to the naked eye, was discovered by him in a pool at El Kab in Egypt. At first Schmarda mistook this animal for a crustacean larva, but the "Raderorgan" and jaws showed that it was a Rotifer. The jaws had seven teeth on each side. Schmarda's type specimen is missing, and the species which he described has not been reported by any subsequent worker.

8. In drawing up his description and preparing his figures of this species, Schmarda was severely handicapped by reason of the fact that he was working under field conditions and had no opportunity for studying the animal at leisure. This stand is taken also by Daday, 1903 (*Mikroskopische Süßwassertiere aus Kleinasien. Wien. Sitzungsber. (Math.-Natur. Kl.)* **112** (Abth. 1) : 139-168). When after the publication of the name *Pedalion*, the view was advanced that the genus so named was indistinguishable taxonomically from the genus *Hexarthra* Schmarda, Hudson objected on the ground that Schmarda had described the six plumose appendages as originating from the ventral side, as in a nauplius larva, while in his genus *Pedalion* these appendages were arranged around the animal. Hudson admitted, however, the difficulty of studying the arrangement of the hairs on the appendages of *Pedalion* species, a difficulty which may be illustrated by the mistakes which he himself made in some of his own figures and descriptions.

9. Daday (1886, *Morph. Physiolog. Beiträge zur Kenntniss der Hexarthra polyptera* Schmarda. *Termesztudományi Füzetek* **10** : 214-249, pls. VIII, IX) believed that, in representing the appendages of *Hexarthra polyptera* as arising from the ventral side of the animal, Schmarda had been influenced by the apparent similarity between members of the genus *Pedalion* and the nauplius larva of Crustacea, a resemblance which, though apparent at first glance, is found on closer examination to be entirely superficial in character.

10. Levander (1894, *Beiträge zur Kenntniss der Pedalion Arten mit einer Tafel. Soc. Faun. Flor. fenn.* **11** : 1-34, figs. 1, 2, 3) considered that, if one were to identify *Pedalion* with *Hexarthra*, it would be necessary to attribute to Schmarda a lack of observation which, in his view, there was no ground for assuming. Levander quoted the opinion of Plate—that, if Schmarda could show (as he did) the arrangement of the hairs on the appendages (which in *Pedalion* are found only on the ventral appendage) and the number of teeth in the jaws, he could not possibly have made the mistake of representing appendages as arising from the ventral side of the animal instead of being arranged in a circle around it. Plate concluded that, in view of these facts, the presence of hooks on appendages other than the ventral appendage, and the origin of the appendages from the ventral side of the animal, it was impossible to synonymise *Hexarthra* with *Pedalion*. As regards Plate's comment on these lateral hooks on the appendages, it is, however, worth noting that Daday recorded the presence of similar hooks on the dorsal appendage in his figure of his *Pedalion mucronatum* Daday, 1909 (*Trav. Soc. Nat. Petersb.* **39** : 9-38, pl. 1, figs. 2-6), a nominal species which has been identified with *Pedalion oxyure* Sernov, 1903 (*Turkestanskago Otd. imp. russ. geogr. Obsch.* **4** (Pt. 3) : 9, pl. 1, figs. 2, 3), in the figures of which no lateral hooks are shown on the dorsal appendage. This difference between the illustrations given by Sernov and Daday, to which attention has not so far been drawn, has not prevented authors from accepting *Pedalion mucronatum* Daday and *Pedalion oxyure* Sernov as being no more than different names for a single species. I have never noted lateral hooks on any but the ventral appendage. Daday's (1909) representation of hooks on the dorsal appendage may be due to incorrect interpretation. (See below).

11. Thus against the view that *Hexarthra polyptera* Schmarda is a species of the genus that Hudson named *Pedalion* is the observation by Schmarda that the appendages arise from the ventral surface and that there are lateral hooks on appendages other than the ventral appendage. As already noted however Daday himself showed incorrectly the presence of such hooks in his *P. mucronatum* (= *P. oxyure* Sernov). It must be noted also that at times the fold of the integument on the appendages can give a somewhat laddered appearance which under low magnifications may be mistaken for hooks. The presence of jaws in *H. polyptera* speaks for its being a rotifer. In view of the absence of posterior digitiform appendages posteriorly (such as are found in *Pedalion mira* Hudson), Schmarda's species might well belong to the *fennicum*-group of the genus *Pedalion*. The arrangement of the hairs on the appendages is very similar to that found in a species of *Pedalion* which occurs in the Saskatchewan lakes of Canada. The principal objection to the acceptance of Schmarda's species as belonging to the genus *Pedalion* is therefore his statement that the appendages come from the ventral side of the animal. As regards this, it must be noted, however, that a similar appearance can be obtained by placing a specimen of an undoubted species of *Pedalion* under a cover slip, the weight of which has flattened the animal (Schmarda's figure seems to have been drawn from a flattened specimen); unless one constantly alters the focus while drawing the animal as a whole or one of its appendages in order to obtain the correct relation, it is very easy to arrive at the same conclusion as that reached by Schmarda. An inaccuracy of this kind on the part of Schmarda would not be surprising if we recall the difficulties with which he was faced, by reason of having to examine his material in the field instead of in a laboratory.

12. The next point which it is important to note is that Schmarda found his species *Hexarthra polyptera* in abundance in the waters which he examined. This fact suggests that that species, whatever it was, would have been found again by subsequent workers. The species *Pedalia fennicum* Levander, 1892 (*Zool. Anz.* **15**: 403) has, in fact, been reported from North Africa, where it appears to be rather widely distributed. Recent observations show that this species shows considerable variation in the arrangement of the hairs and some variation in the tooth formula—a fact which may account, in part, for some of the special features shown in Schmarda's figures. Further, Bryce in his paper on the Rotifera of Devil and Stump Lakes (1924, *J. Quekett microscop. Club* **15**: 81-108) mentioned having examined a slide of *Pedalia* from El Kab (the type locality of Schmarda's species) that had been prepared by Rousselet. I have myself examined a slide of a specimen from this locality that was bought from Rousselet by the United States National Museum. The specimen mounted on this slide is a *Pedalion*.

13. The conclusion which I draw from an examination of Schmarda's (admittedly poor) description and figure is that the species which he described as *Hexarthra polyptera* belongs to Hudson's genus *Pedalion*. This conclusion becomes a virtual certainty, now that we have an actual specimen of a *Pedalion* from the very pond in which Schmarda took his *polyptera* but in spite of the abundance of that species noted by Schmarda no specimen of a species belonging to a separate genus recognisable from Schmarda's description as *Hexarthra*

is known from that very restricted locality. Schmarda's description of the arrangement of the hairs on the ventral appendages, the number of hooks on the ventral appendage that he noted, as also the number of teeth (seven) in each uncus, all place the animal described by Schmarda in the *fennicum*-group of the genus *Pedalion*.

14. In the light of the foregoing considerations, I reach the conclusion that the nominal genera *Hexarthra* Schmarda, 1854, and *Pedalion* Hudson, 1871, must, on taxonomic grounds, be regarded as subjectively identical with one another. Accordingly, the name which under the Code should be applied to this genus is *Hexarthra* Schmarda and, as it is the older of the two names, would still be the correct name for this genus, even if *Pedalion* Hudson, 1871, were not an invalid homonym. In view of the considerable discussion that has taken place in regard to this question and also of the importance and interest of this genus, I think that it is important that this subject should now be closed by the name *Hexarthra* Schmarda being placed on the *Official List of Generic Names in Zoology* and the invalid name *Pedalion* Hudson, 1871, on the *Official Index of Rejected and Invalid Generic Names in Zoology*, together with the reputed, but non-existent, name *Pedalia* Barrois, 1878. It would be useful also if all other invalid uses of the name *Pedalion* subsequent to the name *Pedalion* Dillwyn, 1817 (Class Pisces) were at the same time to be relegated to the *Official Index*.

15. At this point we encounter a difficulty of quite a different order. The nominal species *Hexarthra polyptera* Schmarda, though incorrectly and inadequately described, must be regarded as belonging to the highly variable group represented by *Pedalion fennicum* Levander, 1892. Accordingly, under the Code the trivial name *polyptera* Schmarda, 1854, being much older than *fennicum* Levander, would replace the latter name. The trivial name *fennicum* Levander is however so deeply entrenched in the literature that its replacement by the hitherto contentious name *polyptera* Schmarda would certainly give rise to confusion and would be open to strong objection. In order to prevent this confusion, I accordingly ask the International Commission on Zoological Nomenclature to use its plenary powers to suppress the trivial name *polyptera* Schmarda, thereby validating the later name *fennicum* Levander for the same species. As part of this proposal, I ask the International Commission to use the same powers to designate *Pedalion fennicum* Levander, 1892, to be the type species of *Hexarthra* Schmarda, in place of the older nominal species *Hexarthra polyptera* Schmarda, the name of which it is now proposed should be suppressed. The trivial name *fennicum* Levander, 1892 as published in the binominal combination *Pedalion fennicum* should then be placed upon the *Official List of Specific Trivial Names in Zoology*. Incidentally, it would be helpful if at the same time the International Commission were to place on this *Official List* the trivial names, each an available name and the oldest name for the species concerned, of two other well-known species of this genus. These trivial names are: (1) the trivial name *mira* Hudson, 1871 (*Mon. microscop. J.* 6 : 121) (as published in the binominal combination *Pedalion mira*); (2) the trivial name *intermedia* Wiszniewski, 1929 (*Bull. Acad. pol. Sci. Lettr.* (Cl. Sci. math. nat.) (B) 1929 (2) : 137) (as published in the binominal combination *Pedalia intermedia*).

16. The specific proposals which I now therefore lay before the International Commission on Zoological Nomenclature are that it should :—

(1) use its plenary powers :—

(a) to suppress, for the purposes of the Law of Priority but not for those of the Law of Homonymy the trivial name *polyptera* Schmarda, 1854 (as published in the binominal combination *Hexarthra polyptera*) ;

(b) to set aside the indication, by monotypy, of *Hexarthra polyptera* Schmarda, 1854, as the type species of the genus *Hexarthra* Schmarda, 1854, and having done so, to designate *Pedalion fennicum* Levander, 1892, to be the type species of that genus ;

(2) place the generic name *Hexarthra* Schmarda, 1854 (type species, by designation, as proposed in (1) (b) above, under the plenary powers : *Pedalion fennicum* Levander, 1892) (gender of generic name : feminine) on the *Official List of Generic Names in Zoology* ;

(3) place the under-mentioned generic names or reputed generic names on the *Official Index of Rejected and Invalid Generic Names in Zoology* :-

(a) *Pedalia* Barrois, 1878 (a reputed but non-existent name) ;

(b) *Pedalion* Swainson, 1838 (a junior homonym of *Pedalion* Dillwyn, 1817) ;

(c) *Pedalion* Hudson, 1871 (a junior homonym of *Pedalion* Dillwyn, 1817) ;

(d) *Pedalion* Buckton, 1903 (*Monogr. Membr.* 6 : 251) (a junior homonym of *Pedalion* Dillwyn, 1817) ;

(4) place the under-mentioned trivial names on the *Official List of Specific Trivial Names in Zoology* :—

(a) *fennicum* Levander, 1892 (as published in the binominal combination *Pedalion fennicum*) (trivial name of species proposed, under (1) (b) above, to be designated as the type species of *Hexarthra* Schmarda, 1854) ;

(b) *intermedia* Wisniewski, 1929 (as published in the binominal combination *Pedalia intermedia*) ;

(c) *mira* Hudson, 1871 (as published in the binominal combination *Pedalion mira*) ;

(5) place the trivial name *polyptera* Schmarda, 1854 (as published in the binominal combination *Hexarthra polyptera*) (a name proposed, under (1) (a) above, to be suppressed under the plenary powers) on the *Official Index of Rejected and Invalid Specific Trivial Names in Zoology*.